



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/090,871	03/05/2002	Rajiv Laroia	Flarion-4/APP	7954
26479	7590	01/19/2006	EXAMINER	
STRAUB & POKOTYLO 620 TINTON AVENUE BLDG. B, 2ND FLOOR TINTON FALLS, NJ 07724			DYKE, KERRI M	
			ART UNIT	PAPER NUMBER
			2667	

DATE MAILED: 01/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/090,871	<b>Applicant(s)</b> LAROIA ET AL.	
	<b>Examiner</b> Kerri M. Dyke	<b>Art Unit</b> 2667	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 March 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 21-54 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-54 is/are rejected.
- 7) ☒ Claim(s) 30,31,35 and 36 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 March 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/24/02, 2/19/03</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Claims 1-20 have been canceled.
2. Claims 37-54 have been added.
3. Claims 21-54 are currently pending.

### ***Drawings***

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: [fig.-#] 3-300, 6-608, 8-800, 9-908, 11-1104, 13-1300, 13-1304, and 14-1400. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

5. Claims 30-31 and 35-36 are objected to because of the following informalities: Each of the claims begins by specifying the one of the first or last symbol is the last symbol, but the following limitations refer back to the first symbol. It seems that copying and pasting the

Art Unit: 2667

preceding claims caused this error. Except for the first occurrence references to the first symbol will be treated as references to the last symbol instead. Claim 36 is dependent from claim 35 but it would appear this is a typo. Claim 36 will be treated as dependent from claim 32. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. The term "substantially" in claim 1 is a relative term which renders the claim indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The examiner suggests replacing or supporting the term with a more specific range of timing adjustment.

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. **Claims 21-23 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Knutson et al. (US 6,563,862).**

Art Unit: 2667

11. In regards to claim 21, Knutson discloses a communications system, comprising: a first base station, the first base station including: i) a base station clock (figure 4-411), ii) a receiver circuit for receiving symbols coupled to said clock (4-112), the receiver circuit having fixed symbol timing (column 8 line 24); and iii) a transmitter circuit for transmitting symbols coupled to said clock (4-111), the transmitter circuit having fixed symbol timing (column 8 line 24); and a first mobile communications device for receiving symbols broadcast by said first base station and transmitting symbols to said first base station, the mobile communication device including: i) a receiver circuit for receiving signals from said first base station (4-122), the receiver circuit including receiver symbol timing adjustment circuitry for adjusting receiver symbol timing as a function of a signal received from said first base station (4-431); and ii) a transmitter circuit for transmitting symbols to said first base station (4-121), the transmitter circuit including transmitter symbol timing control circuitry slaved to said receiver symbol timing adjustment circuitry (4-251), the transmitter symbol timing control circuitry making adjustments to the transmitter symbol timing which are the same or substantially the same as the adjustments made by the receiver symbol timing adjustment circuitry to the receiver symbol timing (col. 8 lines 1-6 disclose that the transmitter clock is slaved to the receiver clock and makes the same adjustments).

12. In regards to claim 22, Knutson discloses the system of claim 21, wherein the signal received from said first base station is a timing control signal used to control the receiver circuit to make a symbol timing correction. Column 7 lines 49-53 discloses that a signal is received at the handset from the base station. The signal is used for timing correction, which means the signal can be thought of as a timing control signal.

Art Unit: 2667

13. In regards to claim 23, Knutson discloses the communication system of claim 21, further comprising: a second mobile communications device for receiving symbols broadcast by said first base station and transmitting symbols to said first base station, the mobile communication device including: i) a receiver circuit for receiving signals from said first base station, the receiver circuit including receiver symbol timing adjustment circuitry for adjusting receiver symbol timing as a function of a signal received from said first base station; and ii) a transmitter circuit for transmitting symbols to said first base station, the transmitter circuit including transmitter symbol timing control circuitry slaved to said receiver symbol timing adjustment circuitry, the transmitter symbol timing control circuitry making adjustments to the transmitter symbol timing which are the same or substantially the same as the adjustments made by the receiver symbol timing adjustment circuitry to the receiver symbol timing. Column 4 line 66 – column 5 line 5 discloses that there may be multiple mobile devices and each operate using the same method.

14. In regards to claim 25, Knutson discloses the system of claim 23, wherein the transmitter included in said first base station is an OFDM transmitter. Column 4 line 50 discloses that the system may operate using OFDM. Column 9 lines 9-19 also discloses that the system is compatible with many different modulation techniques and one skilled in the art would readily recognize the modifications needed for each modulation scheme.

***Claim Rejections - 35 USC § 103***

15. **Claims 26-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dagdeviren et al. (EP 0933897) in view of Spruyt et al. (EP 0820171) both of which were supplied by the applicant on the IDS.**

Art Unit: 2667

16. In regards to claim 26, Dagdeviren discloses a method of making symbol timing adjustments in a communications device including a transmitter which transmits multiple symbols in each of a plurality of dwells, the method comprising the step of: determining the number of samples by which the symbol timing is to be delayed during a dwell; increasing the number of samples in one of a first symbol and a last symbol of said dwell by the determined number of samples when said symbol timing is to be delayed during said dwell by the determined number of samples. Paragraph 49 line 24 discloses that Dagdeviren refers to a dwell, which is a set of tones lasting a period of time, as a symbol. Paragraph 24 lines 34-35 discloses that a number of samples are added to the cyclic extension in order to delay and maintain synchronization. Dagdeviren does not disclose decreasing the number of samples in one of the first symbol and the last symbol of said dwell by the determined number of samples when said symbol timing is to be advanced during said dwell by the determined number of samples.

Spruyt discloses in column 2 lines 28-31 that the alignment is done by duplicating or deleting symbols.

It would have been obvious to one of ordinary skill in the art to align the symbols of Dagdeviren's system by either duplicating or deleting symbols as taught by Spruyt because doing so aligns the boundaries of received and transmitted symbols, as taught by Spruyt in column 2 lines 28-31 and reduces the complexity of echo cancellation, as taught in column 2 lines 18-19.

17. In regards to claim 27, Dagdeviren and Spruyt disclose the method of claim 26, wherein the number of samples in the remaining symbols in the dwell which includes said one of the first symbol and the last symbol of said dwell to which samples were added or removed to adjust

Art Unit: 2667

symbol timing do not have their number of symbols changed as part of making symbol timing adjustments. Dagdeviren discloses the presence of the cyclic extension in the first and last symbols only in figure 7. Therefore the intervening symbols of the dwell cannot be affected because only the cyclic extension is modified in order to delay or advance the dwell.

18. In regards to claim 28, Dagdeviren and Spruyt disclose the method of claim 26, wherein said one of a first symbol and a last symbol of said dwell is said first symbol, the first symbol including a cyclic prefix portion and a body portion; and wherein increasing the number of samples in said first symbol includes: copying samples from the body portion of said first symbol and inserting the copied samples at the start of said first symbol thereby increasing the number of samples in said first symbol. Spruyt discloses duplicating samples of the body portion in column 2 lines 28-29. Dagdeviren discloses that the changes are made only to the cyclic extension, i.e. the duplicated portion is added to the cyclic extension only, in page 5 lines 34-35.

19. In regards to claim 29, Dagdeviren and Spruyt disclose the method of claim 26, wherein said one of a first symbol and a last symbol of said dwell is said first symbol, the first symbol including a cyclic prefix portion and a body portion; and wherein decreasing the number of samples in said first symbol includes: removing samples from the start of the cyclic prefix portion thereby decreasing the number of samples in said first symbol. Spruyt discloses deleting samples in column 2 lines 28-29. Dagdeviren discloses that the changes are made only to the cyclic extension, i.e. the deleted portion is taken from the cyclic extension only, in paragraph 24 lines 34-35.

20. Claims 30 and 31 are rejected upon the same basis as claims 28-29. Claims 30-31 recited the same limitations are claims 28-29 but the changes are made to the last symbol instead of the



Art Unit: 2667

first symbol. Dagdeviren discloses that the cyclic extension portion is really just one total value that is illustrated as occurring at the first and last symbol of each dwell in page 5 lines 5-8, therefore the designation of first and last symbol has no meaning.

21. Claims 32-36 are rejected upon the same basis as claims 26 and 28-31. Claims 32-36 recite the same limitations as claims 26 and 28-31 except they are written in relation to a device instead of a method. Dagdeviren figure 14 and Spruyt figure 1 disclose devices that can perform the method steps of claims 26 and 28-31.

**22. Claims 37-41 and 43-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knutson et al. (US 6,563,862) in view of Dagdeviren et al. (EP 0933897).**

23. In regards to claim 37, Knutson discloses a method for adjusting symbol timing in a first communications device in a Orthogonal Frequency Division Multiplexing system, the method comprising: determining a receiver symbol timing adjustment to be made to adjust receiver symbol timing in said first communications device to synchronize receiver symbol timing to the symbol timing of a second communications device; and adjusting the symbol timing of a transmitter in said first communications device as a function of said determined receiver symbol timing adjustment (see claim 21 rejection). Knutson does not disclose said step of adjusting the symbol timing of the transmitter including selecting one of a first and a last symbol in a dwell to be modified to adjust the transmitter symbol timing, said dwell being a period of time comprising multiple symbol tones prior to switching to another tone or set of tones.

Art Unit: 2667

24. Paragraph 49 line 24 discloses that Dagdeviren refers to a dwell, which is a set of tones lasting a period of time, as a symbol. Paragraph 24 lines 34-35 discloses that a number of samples are added to the cyclic extension in order to delay and maintain synchronization.

25. It would have been obvious to one of ordinary skill in the art to use dwells, as taught by Dagdeviren, in the symbol adjustment scheme of Knutson because dwells are commonly used in communication systems as taught by Dagdeviren in paragraph 49 lines 23-25.

26. In regards to claim 38, Knutson and Dagdeviren disclose the method of claim 37, wherein said receiver symbol timing adjustment indicates that symbol timing should be adjusted by an amount corresponding to D digital signal samples. Knutson discloses adjusting by D samples in column 8 lines 1-6. Dagdeviren discloses adjusting by D samples in figures 9 and 10.

27. Claim 39 is rejected upon the same basis as claim 22.

28. In regards to claim 40, Knutson and Dagdeviren disclose the method of claim 38, wherein the first communication device is a wireless terminal (104, 106). Knutson discloses in figure 1 a base station with a plurality of wireless terminals.

29. In regards to claim 41, Knutson and Dagdeviren disclose the method of claim 40, wherein the second communication device is a base station (102). Knutson discloses in figure 1 a base station with a plurality of wireless terminals.

30. In regards to claim 43, Knutson and Dagdeviren disclose the method of claim 40, further comprising: adjusting the symbol timing of a receiver included in said first communications device to delay said receiver symbol timing by said D samples; and wherein the step of adjusting the symbol timing of said transmitter in said first communications device includes delaying the transmission of symbols by D samples by modifying the selected symbol by adding D samples to

said selected symbol thereby increasing the duration of the selected symbol. Dagdeviren discloses adding D samples in paragraph 24 lines 34-35.

31. In regards to claim 44, Knutson and Dagdeviren disclose the method of claim 43, wherein symbols in said dwell other than said selected symbols are not changed as part of adjusting the symbol timing of said transmitter. Dagdeviren discloses the presence of the cyclic extension in the first and last symbols only in figure 7. Therefore the intervening symbols of the dwell cannot be affected because only the cyclic extension is modified in order to delay or advance the dwell.

32. In regards to claim 45, Knutson and Dagdeviren disclose the method of claim 43, wherein the first symbol in said dwell is selected as said selected symbol, the selected symbol having N samples, the step of modifying the selected symbol by adding D samples including: copying D samples from a body of said first symbol and inserting the D copied samples at the start of said selected symbol to produce a modified first symbol having N+D samples. Dagdeviren figures 9 and 10 disclose adding D symbols copied from the body into the cyclic extension. The symbols can be added either to the first symbol or the last symbol of the dwell. The selected symbol inherently has N samples and the modified symbol inherently has N+D samples.

33. In regards to claim 46, Knutson and Dagdeviren disclose the method of claim 43, wherein the last symbol in said dwell is selected as said selected symbol, the selected symbol having N samples, the step of adjusting the symbol timing further including: copying D samples from a body of said selected symbol and inserting the D copied samples at the end of said selected symbol to produce a modified last symbol having N+D samples. Dagdeviren figures 9 and 10 disclose adding D symbols copied from the body into the cyclic extension. The symbols can be

Art Unit: 2667

added either to the first symbol or the last symbol of the dwell. The selected symbol inherently has N samples and the modified symbol inherently has N+D samples.

**34. Claims 24, 42, and 47-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knutson et al. (US 6,563,862) in view of Dagdeviren et al. (EP 0 933 897) further in view of Spruyt et al. (EP 0 820 171).**

35. In regards to claim 47, Knutson and Dagdeviren disclose the method of claim 40, but not wherein the step of adjusting the symbol timing of said transmitter in said wireless terminal includes: adjusting the symbol timing of said transmitter included in said first communications device to advance the transmission of symbols.

Spruyt discloses in column 2 lines 28-31 that the adjustment is done by deleting symbols.

It would have been obvious to one of ordinary skill in the art to align the symbols of Knutson and Dagdeviren's system by either deleting symbols as taught by Spruyt because doing so aligns the boundaries of received and transmitted symbols, as taught by Spruyt in column 2 lines 28-31 and reduces the complexity of echo cancellation, as taught in column 2 lines 18-19.

36. Claims 48-50 disclose limitations similar to claims 28-31, 33-36, and 44-46 and are rejected upon the same basis.

37. Claim 51 is a combination of the limitations of claims 21, 32, and 37 and is therefore rejected upon the same basis.

38. Claim 52 is rejected upon the same basis as claim 32.

39. In regards to claim 53, Knutson, Dagdeviren, and Spruyt disclose the mobile communications device of claim 52, wherein said symbols are frequency division multiplexed

Art Unit: 2667

symbols, the mobile communication device further comprising: an antenna for transmitting symbols including a symbol whose duration has been changed by one of said copy circuitry and said deleting circuitry. Knutson discloses an antenna for transmitting symbols, including those with duration changes in figure 1 element 121.

40. Claims 54, 42, and 24 include limitations where the mobile device is in communication with two separate base stations at the same time. The mobile device is able to independently adjust each signal in order to correct the timing individually for each base station. Knutson, Dagdevrin, and Spruyt disclose methods for adjusting the timing when in communication with one base station, but not in communication with two base stations. It is common and well-known that mobile devices will be in contact with two base stations during handover. It therefore would have been obvious to one of ordinary skill in the art to modify the timing adjustment method and device of Knutson, Dagdeviren, and Spruyt in order to adjust two individual signals from different base stations.

### ***Conclusion***

41. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The references cited on the 892 form each disclose a method and apparatus for adjusting and synchronizing the transmission timing of a mobile device in response to signaling received from a base station.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kerri M. Dyke whose telephone number is (571) 272-0542. The examiner can normally be reached on Monday through Friday, 7:00 am - 3:30 pm.

Art Unit: 2667

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (571) 272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

kmd

  
CHI PHAM  
SUPERVISORY PATENT EXAMINER  
1/17/06